



M-WERC Report: Smart Cities Technologies for the City of Milwaukee



Sponsoring Organizations

Midwest Energy Research Consortium

M-WERC is a regional industry consortium that focuses on three mission areas: technology research and innovation; market, industry, and technology roadmap development; and start-up company commercial acceleration. M-WERC has funded more than 30 research projects, developed four industry roadmaps, and launched numerous start-up companies. M-WERC is headquartered in Milwaukee, WI. M-WERC's active working groups, including the Smart Cities Technologies working group, which will be launched in the first half of 2017, based in part of the contents of this report.

Website: <http://m-werc.org/>

City of Milwaukee – Environmental Collaboration Office (ECO)

The Environmental Collaboration Office, or ECO, strives to make Milwaukee a world-class eco-city. ECO develops practical solutions that improve people's lives and the economy while working to protect and restore the natural ecosystems that support our long-term prosperity. We collaborate with the community, develop global partnerships, offer award-winning programs, and implement the City's *Refresh Milwaukee* sustainability plan.

Website: <http://city.milwaukee.gov/eco>

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References

Key sources of current information on Smart Cities include the following:

- **Envision: America** – a program endorsed by the Obama Administration to share best practices in smart city initiatives between cities across the U.S. - <http://www.envisionamerica.org/>
- **Smart Cities Council** – a network of leading companies advised by top universities, laboratories and standards bodies - <http://smartcitiescouncil.com/>
- **Smart Cities Challenge** – a program focused on transportation solutions, sponsored by the U.S. Department of Transportation - <https://www.transportation.gov/smartcity>
- **LabCities** – a Smart City business network - <http://www.labcities.com/>
- **Global City Teams Challenge** – a collaborative network of project teams working on ground breaking applications of IoT technologies within the smart city/community environment - <https://www.us-ignite.org/globalcityteams/>
- **Smart Cities Council** – a resource of information and resource guides to assist Smart Cities efforts - <http://readinessguide.smartcitiescouncil.com/>

M-WERC Report: Smart Cities Technologies for the City of Milwaukee

Introduction

This report documents efforts undertaken in 2016 by the City of Milwaukee and the Midwest Energy Research Consortium (M-WERC) to explore opportunities to expand upon initial Smart Cities activities in Milwaukee. It creates a framework and initiative to move forward with future efforts.

The City of Milwaukee has embarked on a number of Smart Cities and Internet of Things (IoT) activities, but desires to learn more about what other cities were doing in this area, and to use such information to create a framework and plan by which further activities could be guided and optimized. As a result, the City partnered with M-WERC so that the Consortium could engage its member base and identify new companies to participate in future efforts—acting as a “technology partner” for the City. Both the City and M-WERC participated in the *Envision: America* program in 2016 as a way to jump-start efforts and identify lessons-learned and best practices from other cities undertaking similar initiatives.

Through *Envision: America*, a number of technology and service providers provided key insights and expertise. Many of these providers will be asked to participate in a “Smart Cities Technologies Working Group” that will be formed in early 2017. The working group will be facilitated by M-WERC under the direction of the City of Milwaukee, and funded/sponsored by the corporate participants and technology/service providers in the working group.

Based on the initial results of this initiative, M-WERC has also started to work with other municipalities in Wisconsin on their Smart Cities initiatives. It will reach out to partner organizations in surrounding states to identify possible collaborative opportunities with those partners and other municipalities in those states.

Smart Cities Overview

Smart Cities is a term that has recently been adopted on a widespread basis to cover a range of technologies and solutions that are intended to improve city services and enhance the quality of life for urban residents and visitors. Closely related topics include the Internet of Things (IoT) and adoption of 21st century city-scale advanced infrastructure. One definition of “Smart Cities” from Technopedia¹ reads as follows:

A smart city is a designation given to a city that incorporates information and communication technologies (ICT) to enhance the quality and performance of urban services such as energy, transportation and utilities in order to reduce resource consumption, wastage and overall costs. The overarching aim of a smart city is to enhance the quality of living for its citizens through smart technology.

The Internet of Things (IoT) can be defined as:

...the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.²

One of the great values and promises of Smart Cities is the ability to transform how citizens and visitors to Milwaukee interact in an urban environment with city services and municipal services. Much like smart phones have completely transform how people communicate with each other and have access to data and information in unprecedented new ways, so do Smart Cities have the potential to completely change how people live, work, and play in urban environments.



Smart Cities also have the potential to attract and retain the best and brightest from a talent and workforce development standpoint. A Smart Cities strategy supports an entrepreneurial tech culture in the City that will help attract and retain businesses and talent.

In addition, as Smart City is a relatively new term, the Smart Cities Council³ notes that “The smart city sector is still in the ‘I know it when I see it’ phase, without a universally agreed definition. The Council defines a smart city as one that has digital technology embedded across all city functions.”

Invariably, any organization or service provider covering Smart Cities technologies has developed an infographic or visual representation of the various end-user services that are enabled by Smart Cities Technologies (SCT), such as the one depicted here.

¹ <https://www.techopedia.com/definition/31494/smart-city>

² https://en.wikipedia.org/wiki/Internet_of_things

³ <http://readinessguide.smartcitiescouncil.com/>

One of the objectives of this report is to create an initial framework on Smart Cities Technologies (SCT), starting with an inventory of the technologies that are of interest to the City of Milwaukee, as well as technologies and services currently being offered by the members of the working group that will be formed in 2017.

The working group will be charged with refining and finalizing a list of SCT products and services, as well as initial demonstration projects, using this document as starting point. This SCT list will likely evolve over time, and will provide a framework that other municipalities can review for their initiatives. For purposes of this report, we are starting with this list of services:

- A. **Connectivity** – providing internet, connectivity, and infrastructure for urban networks
- B. **Streetlights** – smart streetlights that utilize their ubiquitous locations throughout the City to interconnect and provide advanced technologies to also collect data, video, and other information
- C. **Transportation** – applications to coordinate trip planning and the user experience between the City’s streetcars, the Milwaukee County Transportation System (MCTS), ‘Bublr’ bicycles, and other mass transit services.
- D. **Traffic** – smarter traffic lights to better align traffic flows based on real-time and distributed data sources.
- E. **Parking Meters** – intelligent parking meters that improve the efficiency of vehicle parking
- F. **Public Safety** – applications related to police connectivity, shot spotter, and other public safety and police functions.
- G. **Smart Grid/Smart Energy** – including advanced distribution systems, Microgrids, and urban applications of renewable energy generation
- H. **Smart Buildings** – digital controls in buildings to more efficiently manage heating, ventilation and air-conditioning (HVAC), lighting, and customer experience.
- I. **Data-Driven Urban Planning** – providing access to big data applications and enabling city planners to assess neighborhood needs better.
- J. **Environmental Sensors** – hardware to measure environmental metrics in the built environment, including weather data, pollution, and ambient sound.
- K. **Stormwater Management** – outfitting green infrastructure with sensors and controls to better manage stormwater.
- L. **Waste Management** – using data and connected devices to optimize waste collection.
- M. **Disaster Management** – helping local governments make quicker and more informed, data-driven decisions prior to and during natural disasters.

There are a large and expanding number of cities in the U.S. and around the world undertaking Smart Cities initiatives. Many of these cities have developed programs and initiatives that have been in place for several years, which other cities are just getting started. The City of Milwaukee, as part of the working group, should strive to learn as many “lessons learned” from these cities and avoid “re-inventing the wheel.”

Some notable examples include:

- [Charlotte, NC](#)
- [Chicago, IL](#)
- [Columbus, Ohio](#)
- [Kansas City, KS](#)
- [Copenhagen](#)



Existing initiatives already underway can be adapted to and expanded as part of the Smart City initiative for the City of Milwaukee, one example being the current “Better Building Challenge” that M-WERC is working on with the City, under a U.S. Department of Energy grant. The Better Buildings

Challenge - Milwaukee (BBC-MKE) is a comprehensive energy efficiency program that provides all of the tools and resources that building owners and property managers need to effectively develop and implement energy efficiency projects in their buildings. M-WERC is the technology lead organization for this effort and will be supporting the City of Milwaukee in this effort going forward, but will assess how SCT efforts can work with the BBC effort in concert going forward.

A large number of companies are providing Smart Cities services as either technology providers or as consultants. A partial list of companies currently offering products and services include:

- Accelerated Innovations
- Allied Telesis
- AT&T
- Autodesk
- Black & Veatch
- CH2M
- Cisco
- CommScope
- Current, powered by GE
- Deloitte
- Eaton
- Johnson Controls
- IBM
- Itron, Inc.
- Landis+Gyr
- Microsoft
- OSIsoft, LLC
- Qualcomm
- S&C Electric Co.
- SAS Institute
- Schneider Electric
- Sensus
- ThingWorx
- Wells Fargo

In addition, a rapidly-growing number of start-up companies are vying to challenge traditional technology and service providers in this field.

As noted previously, Smart Cities also have the potential to attract and retain the best and brightest from a talent and workforce development standpoint. In Milwaukee, the M-WERC [WERCBench labs](#) and The Water Council's [Brew Accelerator](#) are two examples of start-up initiatives designed to bring and retain new start-ups to the City.



To the extent that these accelerators are developing IoT technology for city/district scale use, there is the potential to create a framework whereby the City can serve as a living laboratory to pilot new technologies. This will serve as an economic development strategy to also attract businesses from outside the city who want to do “in situ” demonstrations. With this approach, the City hopes to get the private sector to pay for some of this infrastructure in exchange for access to the City’s platforms.

City of Milwaukee Efforts to Date

The City of Milwaukee has undertaken a number of initiatives to date, under the heading of Smart Cities Technologies and/or using Internet of Things (IoT) technology solutions, whether they were identified as Smart City initiatives or not. The intent has been to make the City of Milwaukee a world-class “eco-city” by using technology to enable advances and improve the quality of life for its citizens and visitors.

Current initiatives that the City has undertaken include these three under the heading of “The New Triple Bottom Line” of Ecology, Economy, and E-community:

- Better Buildings Challenge
- Reduce Energy Use in City Buildings 20% By 2020
- Eco Industrial Districts

In addition, the City of Milwaukee has undertaken a number of initiatives that were pursued separately by various city departments, all of which support Smart Cities efforts:

- | | |
|---|--|
| • Multimodal Transportation | • Automated Bicycle/Pedestrian Data Collection |
| • Automated Recycling Trucks/Packers | • MKE Parking App |
| • Material Recycling Facility (MRF) | • Vehicle Routing Software |
| • Tree Canopy Mapping | • AVL Technology |
| • Advanced Parking Guidance System | • Automated Bids and Permits |
| • Non-Intrusive Microwave Vehicle Detectors | • MKE Mobile App |

Going forward, the City of Milwaukee may implement additional and advanced Smart Cities Technologies demonstration projects in the four “Eco-Industrial Districts”⁵ that have been identified where redevelopment efforts are underway. Each of these four eco-industrial districts are at various stages of redevelopment, and all have unique characteristics that would lend themselves to deploying different SCT demonstration projects in each of the four locations listed here:

- [30th Street Industrial Corridor/Smart Energy Hub](#)
- [Milwaukee Water Technology District/Reed Street Yards](#)
- [Harbor District](#)
- [Menomonee Valley](#)

The Smart City Working Group to be formed in early 2017 will evaluate a number of possible SCT demonstration projects to be located in these four eco-industrial districts and will focus these demonstration projects to support the overall objectives of the districts, in order to:

- Redevelop the sites primarily for industrial uses
- Incorporate green infrastructure
- Integrate projects into nearby neighborhoods
- Pilot new technologies
- Attract sustainable businesses

⁵ <http://city.milwaukee.gov/eco#>

2016 Activities – Envision: America

The City of Milwaukee was selected to participate in the inaugural **Envision: America** program during calendar year 2016. Endorsed by the Obama Administration and facilitated by the Envision: Charlotte initiative in Charlotte, North Carolina, the intent of the program was to share lessons learned and best practices between leading cities in the Smart City field and cities that were in the “middle of the pack”. Charlotte was one the leading cities and Milwaukee was deemed to be one of the “middle of the pack” cities.

The ten cities selected to participate in 2016 included:

- Cambridge, MA
- Dallas, TX
- Greenville, SC
- Los Angeles, CA
- Milwaukee, WI
- New York City, NY
- Pittsburgh, PA
- Portland, OR
- San Diego, CA
- Spokane, WA



A key aspect of the program was the involvement of corporate sponsors in the Envision: America program. These corporate sponsors funded the two events held in 2016, but also brought expertise and extensive knowledge of the smart cities field, by virtue of their key roles in providing these technologies and services, and consulting / implementing smart cities initiatives in cities across the U.S. and worldwide. Participation in the Envision: America program thus gave outstanding and exceptional access to thought-leaders and experts in the field. Key corporate sponsors and technology/service providers included:

- | | |
|---------------------------|----------------|
| • Accelerated Innovations | • Intel |
| • AT&T | • Itron |
| • Autodesk | • Landis+Gyr |
| • Bank of America | • Microsoft |
| • Black & Veatch | • OSIsoft, LLC |
| • Cisco | • Qualcomm |
| • Duke Energy | • SAS |
| • Esri | • ThingWorx |
| • GE | • Wells Fargo |
| • IBM | |

Cities were asked to select a project or initiative that they were working on at the initial meeting in Charlotte, NC in January 2016. These projects were presented to the entire group of participants (including representatives from the ten cities, the technology/service providers and corporate sponsors, and other stakeholders including federal agency representatives. The City of Milwaukee was represented by Erick Shambarger (ECO) and Benjamin Timm (DCD) and supported by Jeff Anthony (M-WERC). The project the City presented was the Century City Microgrid (CCMG) Project (one of two Microgrid projects presented at the event, the other being from Pittsburgh, PA).

Along with a number of broad presentations on the first day, these presentations by each of the ten cities started the process of sharing between the cities.

The entire second day of the January event was spent with corporate sponsors and technology/service providers working with each city separately to develop and offer suggestions on their particular project. These sessions were extremely useful and productive, providing a large number of insights and takeaways from experts in the field. See Attachment A to this report for detail notes from this session.

The third day of the event focused on reporting back out to the entire group what each of the ten cities gained from the second day, as well as a number of presentations from federal agencies and other stakeholders.

A second event Envision: America was held in June 2016 in Austin, TX and was co-located with another Smart Cities event and a large conference/exhibition on Smart Cities, sponsored by the **Global City Teams Challenge**. Notes from this event are located in Appendix B to this report.

Key takeaways from both events include the following:

1. Engaging with corporate sponsors and technology/service providers early to make any SCT initiative.
2. Providing a platform and common dialog for city departments to work collaboratively and in a common framework to advance initiatives and SCT deployment to avoid duplication of efforts, duplicative of infrastructure – resulting in sub-optimization of asset deployment and financial resources if not coordinated.
3. Making sure to include and engage citizenry and municipal stakeholders in the process at an early stage.

For 2017, the following cities were selected to participate in the Envision: America program, and 2016 participants have been invited to participate in activities this year, but the focus is on these new cities for the current year:

- | | |
|-------------------|-------------------|
| • Birmingham, AL | • Jackson, MS |
| • Burlington, VT | • Kansas City, MO |
| • Chula Vista, CA | • Providence, RI |
| • Detroit, MI | • San Antonio, TX |
| • Greensboro, NC | • Wichita, KS |

2016 Activities – M-WERC and ECO



As described above, the participation in the Envision: America program by the City of Milwaukee – Environmental Collaboration Office (ECO) and M-WERC started the efforts described in this report, and gave this initiative both the starting point and the necessary connections and information to launch the initiative in 2016 as a data-gathering and information collection effort. In 2017, the formation of the working group described in this report will move the initiative into a full implementation mode.

During 2016, in addition to the two Envision: America event, the City of Milwaukee and M-WERC organized two events in Milwaukee to collect more information and educate a variety of organizations on Smart Cities Technologies. Four events in total completed the first year of this initiative:

1. Envision: America – kickoff off meeting in Charlotte, NC – January 2016
2. Wisconsin Sustainability Summit – special session and workshop in Milwaukee, WI – April 2016
3. Envision: America – second meeting in conjunction with other Smart Cities event in Austin, TX – June 2016
4. M-WERC Member Meeting on Smart Cities Technologies – held at Discovery World Museum in Milwaukee, WI – December 2016

Wisconsin Sustainability Summit

As part of early efforts to advance a Smart Cities initiative based in Milwaukee, using the Envision: America lessons learned at the January 2016 event in Charlotte, a portion of the April 2016 “Wisconsin Sustainability Summit” was devoted to Smart Cities topics. A presentation session was organized as follows:

Moderator: **Erick Shambarger**, Environmental Sustainability Director, City of Milwaukee

Speakers and Panelists:

- **Ghassan Korban**, the City of Milwaukee Commissioner of Public Works
- **Roger Drummond**, Director-Intelligent Cities Midwest, GE Current
- **Tim Fairchild**, Director, SAS Global Energy Practice
- **S. Brent O'Daniel**, Black & Veatch Corporation
- **Franz Berkemeier**, OSIsoft, LLC

The presentations in the Smart Cities session on Day One of the event was followed by an interactive workshop with many of the same presenters on the second day of the conference. Notes from this interactive workshop are provided in Appendix B.

M-WERC Member Meeting on Smart Cities Technologies

To accelerate efforts to move into an implementation mode for this initiative in 2017, M-WERC decided to devote its M-WERC Member Meeting in December 2016 to the SCT topic. The event was organized to provide M-WERC members, City of Milwaukee officials, and other stakeholders with access to some of the leading companies implementing SCT initiatives around the U.S. In addition, several exercises were used during the meeting to collect ideas and initiate interactive discussions amongst the attendees and presenters at the event.

M-WERC invited the following industry experts to participate in two presentation sessions on Smart Cities Technologies at this event on December 13, 2016:

- **Lisa A. Brown**, Johnson Controls, Inc.
- **Roger Drummond**, Current - Powered by GE
- **Erick Shambarger**, City of Milwaukee, ECO
- **Mike Mihulic**, OSIssoft, LLC
- **David South**, West Monroe Partners
- **Wes Geisenberger** and **Matt Newman**, Oracle

M-WERC has taken the discussions on Smart Cities at this event to develop the action plan to further the adoption and growth of these technologies. A framework / plan for implementing Smart Cities technologies will be created based on the event's presentations and discussions that followed the meeting, and delivered to the City of Milwaukee in early 2017. The same plan will then be used to work with our cities and municipalities in Wisconsin and the upper Midwest to enable them to adopt the same Smart Cities technologies.

Media Coverage

Part of the efforts to expand this initiative in 2017 will be to get greater media coverage, which will help engage and educate citizens at large. One example of a very positive story that ran in January, 2017 is the story below that ran was published by **21st Century State & Local** and received positive attention in several media outlets:

Milwaukee Ramps Up Smart City Initiative

BY: [ELEANOR LAMB](#) JANUARY 5, 2017 | 4:25 PM

The City of Milwaukee is creating a detailed smart city plan after deploying several smaller Internet of Things (IoT) initiatives over the last couple of years.

In tandem with the Mid-West Energy Research Consortium (M-WERC), Milwaukee is advancing its smart city initiative, which focuses on buildings, district-scalable projects, and eco-industrial districts. According to Erick Shambarger, environmental sustainability director for Milwaukee's Environmental Collaboration Office (ECO), the goal is to find the intersection of new technology and positive environmental impact.



“We have lots underway. We’re moving from one-off projects to a comprehensive plan,” Shambarger said. “This technology is starting to come of age.”

Although Shambarger said he wants to accelerate smart city plans, Milwaukee already features several IoT services. The city’s Department of Public Works has automated packing machines. Milwaukee has digitized maps for tree canopies to track the presence of invasive pests. The city is also home to Bublr Bikes, a bike-sharing system, which Shambarger called “a fantastic example of Internet of Things technology.”

In the year ahead, Shambarger said he would like to direct the city’s focus to increasing the number of smart buildings. He said he envisioned structures with smart heating, ventilation, and air conditioning (HVAC) systems in addition to motion-sensitive lights.

“People think about lighting, but moving air throughout a building is very complicated stuff,” Shambarger said.

To establish these features, Milwaukee is leading the Better Building Challenge. Through this program, which is funded by the Department of Energy, city leaders are attempting to cut down energy use in municipal and downtown private buildings. Shambarger said his goal is to have 200 commercial business owners have some form of smart technology, whether it is LED lights or smart HVAC systems, in three years.

Milwaukee has applied smart city initiatives since January 2015, when it was named a member of Envision: America, a national project that focuses on sharing best practices for smart cities. Envision started as a program for Charlotte, N.C., that was funded through Energy. Envision has since been extended to include 10 cities, which apply for the program.

Shambarger said he shares the Energy Department’s goal of cutting energy use by 20 percent by 2020. Since 2009, Milwaukee municipal buildings have trimmed energy use by 10 percent. He and his team are working with Wisconsin-based companies to provide IT solutions for Milwaukee’s efforts.

“We’re trying to stimulate both sides of the economy,” Shambarger said.

Other recent media coverage includes:

- **Companies, City Collaborate as Milwaukee Aspires for Recognition Among 'Smart Cities'** – Milwaukee Journal Sentinel, December 16, 2016 - <http://www.jsonline.com/story/money/business/energy/2016/12/16/companies-city-collaborate-milwaukee-aspires-recognition-among-smart-cities/95496956/>
- **Milwaukee Enters the Trending Smart City Initiative** – ReadWrite, December 18, 2016 - <http://readwrite.com/2016/12/18/milwaukee-enters-the-smart-city-race/>
- **City of Milwaukee Working with Local Companies to Attain Recognition as a “Smart City”** – Milwaukee Magazine, January 9, 2017 - <https://www.milwaukeeemag.com/2017/01/09/city-milwaukee-working-local-companies-attain-recognition-smart-city/>

2017 Plans – Smart Cities Technologies Working Group

The initial focus of the Smart Cities Working Group will be on a series of demonstration projects and initiatives under the heading of “**Milwaukee Smart Cities Demonstration Working Group for Eco-Industrial Districts for Energy and Water.**” This will provide an initial focus for the working group in 2017, and as part of continuing efforts to adopt Smart Cities and Internet of Things technologies for the City of Milwaukee.

The City of Milwaukee is currently in the process of redeveloping multiple eco-industrial districts, defined as “a former brownfield site that is redeveloped primarily for industrial uses but which has a) green infrastructure b) improved access to the surrounding community c) pilots some form of smart technologies”. These eco-industrial districts are ideally suited for demonstration projects and deployment of Smart Cities technologies in area that are undergoing redevelopment areas right now.

Milwaukee is currently focusing on four eco-industrial districts as follows:

- Menomonee Valley Industrial Center/Stormwater Park
- Reed Street Yards/Milwaukee Water Technology District
- Century City Business Park/Smart Energy Hub
- Harbor District/Harbor Revitalization

The intent of forming the Working Group is to focus on different technologies to be demonstrated and piloted in the four different Eco-Industrial Districts. The Working Group will be organized and populated as follows:

- **Chartered by** City of Milwaukee/Environmental Collaboration Office (ECO).
- **Organized and enabled by** the Midwest Energy Research Collaborative (M-WERC).
- **Facilitated by** a Smart Cities consultant or expert, TBD
- **Established to** ensure coordination with local stakeholders, regional partners, and state agencies.
- **Sponsored by** national corporate entities and M-WERC industrial and academic members who will also provide expertise and guidance to the working group efforts.
- **Participation by** interested City departments including ITMD, DPW, DCD, etc.

Membership in M-WERC will be a pre-requisite for industry and academic participation in this working group.

The work group will a) provide a brief overview of Smart City efforts around the country, 2) focus on recommending one smart city technology for each of the four eco-industrial districts in Milwaukee; and 3) identify possible approaches of public-private partnerships that can help fund and implement the strategies.

Objective: Create a Smart Cities working group, chartered by the City of Milwaukee ECO and facilitated, staffed, and organized by the Midwest Energy Research Consortium (M-WERC) to advance the deployment of Smart Cities technologies in the City of Milwaukee in general, and in the four eco-industrial districts in particular. 2017 will be the first full year of this effort with the formation and ramp-up of the working group, based on the Envision America program, and workshops held in April and December of 2016 in Milwaukee.

Goal: By the end of 2017, have pilot program for multiple Smart Cities technologies deployment activities in various area of the City of Milwaukee, focused on the for eco-industrial districts. (Vision: a map showing each of the four districts, with technologies being deployed in each, and corporate sponsor logos shown for each for where they are participating).

The following information is being used to solicit participation in the working group:



Smart Cities Initiative for Milwaukee, WI

As part of continuing efforts to adopt Smart Cities and Internet of Things technologies for the City of Milwaukee, the City and the Midwest Energy Research Consortium (M-WERC) are partnering to form a **“Milwaukee Smart Cities Working Group for Eco-Industrial Districts.”**

The City of Milwaukee has been exploring a number of “Smart Cities” initiatives to enhance and improve the quality of life in the City as well as to maximize use of advanced technologies in the areas of Smart Cities and Internet of Things to reduce expenditures and realize cost savings through these technology-enabled advancements.

More information on Smart Cities and Internet of Things, as they relate to the City of Milwaukee are contained in the attached overview, with examples of what other cities are exploring and implementing currently. The City of Milwaukee Environmental Collaboration Office has identified three potential areas for exploration, in addition to M-WERC’s existing work on microgrids:

- Smart Streetlights
- Apps to coordinate trip planning and the user experience between streetcar, MCTS, Bublr, and other mass transit
- Smarter traffic lights to better align traffic flows based on data. For example, the City of Boston is getting user data from the WAZE app to make better decisions on transportation planning.

In addition, the City of Milwaukee is currently in the process of redeveloping multiple eco-industrial districts, defined as “a former brownfield site that is redeveloped primarily for industrial uses but which has a) green infrastructure b) improved access to the surrounding community c) pilots some form of smart technologies”. These eco-industrial districts are ideally suited for demonstration projects and deployment of Smart Cities technologies in area that are undergoing redevelopment areas right now.

Milwaukee is currently focusing on four eco-industrial districts as follows:

- [Menomonee Valley Industrial Center](#)
- Reed Street Yards / [Milwaukee Water Technology District](#)
- [Century City Business Park](#) / Smart Energy Hub
- [Harbor District](#)

For the Century City / Smart Energy Hub, one major effort underway involves the development of the Century City Microgrid (CCMG) Project which is intended to provide a full-scale demonstration site for advanced energy technologies and provide a key differentiator for this business park as a unique opportunity for business to locate and take advantage of key features of the microgrid demonstration project. To expand the scope to

include possible Smart Cities technologies in all of the eco-industrial districts listed above, the City of Milwaukee will request that a working group be formed under the direction and auspices of the Midwest Energy Research Consortium (M-WERC) to convene industry leaders to develop recommendations for Smart Cities technology for the City of Milwaukee. The City of Milwaukee will support this effort by providing coordination through the leadership at the Mayor's Office, Environmental Collaboration Office, Information Technology and Management Division, Department of Public Works, and Department of City Development.



Smart Cities and Internet of Things technologies fits within M-WERC's area of expertise. M-WERC focuses on the energy, power, and control industries. Internet of Things technologies, i.e. hardware that is controlled through remote information technology, fits within M-WERCs expertise on controls. The intent of forming the Working Group is to focus on different technologies to be demonstrated and piloted in the four different Eco-Industrial Districts. The Working Group will be organized and populated as follows:

- Chartered by City of Milwaukee / Environmental Collaboration Office ([ECO](#)). Organized and enabled by the Midwest Energy Research Collaborative ([M-WERC](#)).
- Facilitated by a Smart Cities consultant or expert, the intent is to ensure coordination with local stakeholders, regional partners, and state agencies.
- Sponsored by national corporate entities and M-WERC industrial and academic members who will also provide expertise & guidance to the working group.

Membership in M-WERC will be a pre-requisite for industry and academic participation in this working group.

Appendices

Appendix A – Notes from January 2016 Envision America meeting – Charlotte, NC

Appendix B – Overview of April 2016 Smart Cities Workshop at Sustainability Summit

Appendix C – Notes from June 2016 Envision America meeting – Austin, TX

**Appendix D – Overview of December 2016 Smart Cities Technologies Workshop at M-WERC
Member Meeting**

Appendix E – Start-Up Companies in Smart Cities Technologies